

CCT-5300 series

Conductivity Controller

www.ponpe.com

1、 Notice Before Installation:

- 1) Carefully read the relevant parts of this manual before installation and operation to avoid false operation, measurement error and damage of instrument.
- 2) Improper installation and flow speed will cause huge errors, please refer to installation chapter.
- 3) This instrument is for electrochemical measurement, and its installation and operation should be performed by technicians with relevant professional knowledge.
- 4) Any other questions, please contact our customer service. Tel: +86 311 8383 1880

2、 Quality Guarantee:

- 1) Quality guarantee is one year after purchase. Any quality problems within the guarantee period, free maintenance and change will be offered.
- 2) Lifelong maintenance service for our products.
- 3) Free maintenance work will not be offered due to the following reasons:
 - A、 Reassembling and improper operation without permission.
 - B、 Electronic burn due to improper operation and soaked of improper operation and maintenance
 - C、 Consequential loss of incorrect model selection.
 - D、 Cable fracture and damage due to improper installation and operation.
 - E、 Product damage due to improper shipment and storage. (Standard: SJ/T10463-93)
 - F、 Damage due to improper installation and operation.
 - G、 Measurement error due to unapproved cable cut or connection.
 - H、 Internal cable fragmentation under careless disassembling.
 - I、 Consumable material is not included.

Without affecting use of products, any innovations or changes on the products will not be noticed separately

1. Conception

CCT-5300 series conductivity measurement and controller instrument is innovative at technology, with more functional and technical features, high performance at low prices.

1.1 Technical Features

- More reliable: Fully automatic calibration procedure.
- Seamless automatic switch for all ranges, digital temperature compensation.
- Compatible with (0.1、1.0、5.0、10.0) cm^{-1} conductivity cell constant, covering all types of flow between purified water and concentrated water
- Optional for conductivity ($\mu\text{S}/\text{cm}$) or TDS (ppm) .
- Able to check instant water temperature ($^{\circ}\text{C}$)/ trans. current (4~20mA), in favor of problem solution.
- Isolated, transferable 4-20mA current loop, any two transmission range can be set in full-scale range.
- Instru./ Trans mode, Instru. mode support all 4-20mA signal regular. Trans. mode support all two wire PLC system.
- Flexible control application: conductivity high & low limit control/ high level exceed control and hysteresis control.
- LCD display provides clear technical implication of various parameter setting and status, more convenient and clear than the code prompt surface.
- Assisted identification provides clear technical identification for parameter setting and status.
- Terminals on industrialization standard, EMC design (electromagnetic compatibility), platformization in R&D, serialization in product grouping.
- SMT (Surface Mount Technology), AOI (Automated Optical Inspection), ICT whole board analyze, computerized FCT inspection, strict quality management and control means.
- All products have been tested by aging experience, A level in quality.
- Matched calibration, complete packaging and storage of electric meter, conductivity cell; Purchase in accordance with international ordering process.

1.2 Applications

This series applies to all water treatment process monitor and controller, and has a high performance in online measurement and control applicable to high salinity water treatment, concentrated water, circulated cooling water, recycling water and electrolyte deployment.

1.3 Product Catalogue

Model Number	Power Supply	Frequency (Hz)	Current Mode	Constant (cm ⁻¹)	Display
CCT-5300E	DC 24V	-----	Instru. /Trans	0.1~10	3 $\frac{1}{2}$ Digits
CCT-5310E	AC 110V	50/60	Instru. /Trans	0.1~10	3 $\frac{1}{2}$ Digits
CCT-5320	AC 220V	50/60	Instru. /Trans	0.1~10	3 $\frac{1}{2}$ Digits
<u>CCT-5320E</u>	AC 220V	50/60	Instru. /Trans	0.1~10	3 $\frac{1}{2}$ Digits

【Noted】 Model number with E: enhanced electromagnetic compatibility.

1.4 Operation Caution

- For wet environment or centralized 24V power supply, recommend to choose CCT-5300E with DC 24V power supply.
- In case of instable power supply, long distance to substation, large voltage drop power supply circuit end, recommend to choose wide voltage range input AC/DC switch to stabilize power supply to DC 24V, recommend to choose CCT-5300E.
- In case of measurement instability caused by frequency conversion equipment, electronic water treatment equipment, UV lamp electronic ballast device or polluted environment of power supply, recommend to choose EMC enhancement model CCT-5320E.
- For small-scale generating plant of instable power supply, or small-scale water treatment of long distance power supply, in that case recommend to choose wide voltage range input AC/DC switch to stabilize power supply to DC 24V, recommend to choose CCT-5300E.
- Longtime ultraviolet radiation will damage LCD, therefore please do not install in direct sunlight to avoid the damage of LCD.

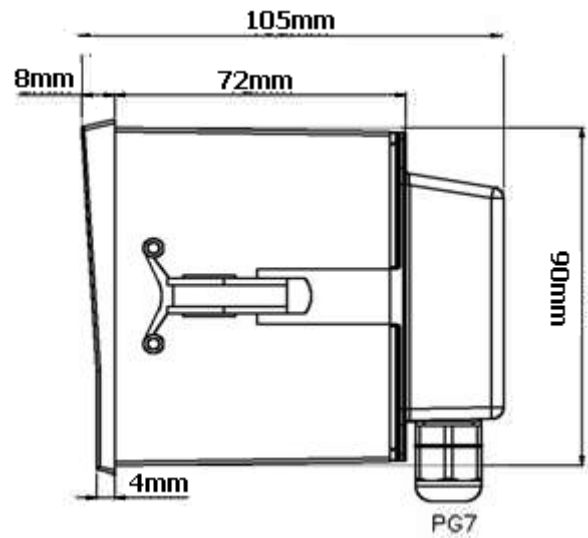
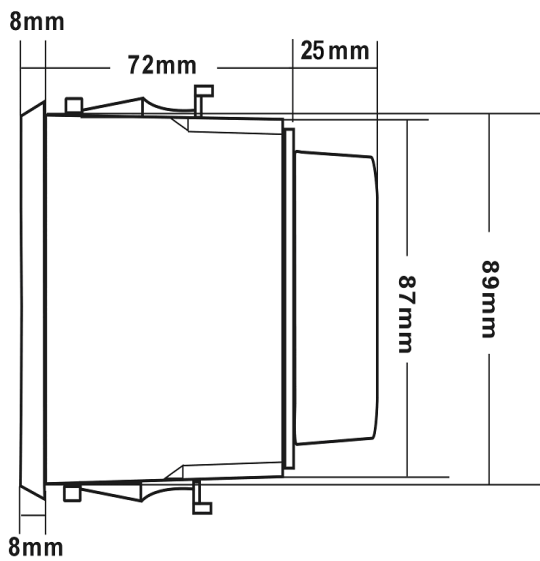
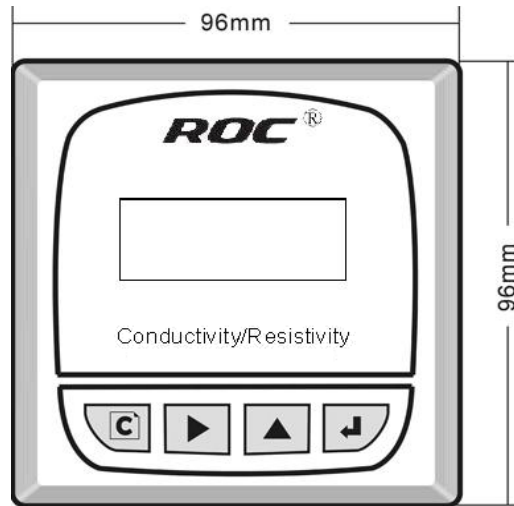
1.5 Main Technical parameters

Product		CCT-5300 Conductivity Controller /TDS Measurement and Controller			
Display		LCD			
Constant		0.10 cm ⁻¹	1.000 cm ⁻¹	5.000 cm ⁻¹	10.0 cm ⁻¹
Constant Range		0.070 ~0.13 0 cm ⁻¹	0.70 ~1.30 cm ⁻¹	3.50 ~6.50 cm ⁻¹	7.00 ~13.0 cm ⁻¹
Meas. Range		0.5~ 199.9 μ S/cm	1.0~1999 μ S/cm	0.05~9.99mS/cm	0.5~19.99mS/cm
Meas. Range	Conductivity	0.5 μ S/cm ~ 19.99mS/cm			
	TDS	0.25ppm ~ 9.99 ppt			
	Temp.	0.0~50.0°C			
Resolution Ratio	Conductivity	0.01 μ S/cm			
	TDS	0.01ppm			
	Temp.	0.1°C			
Accuracy	Conductivity	1.5			
	TDS	1.5			
	Temp.	±0.8°C			

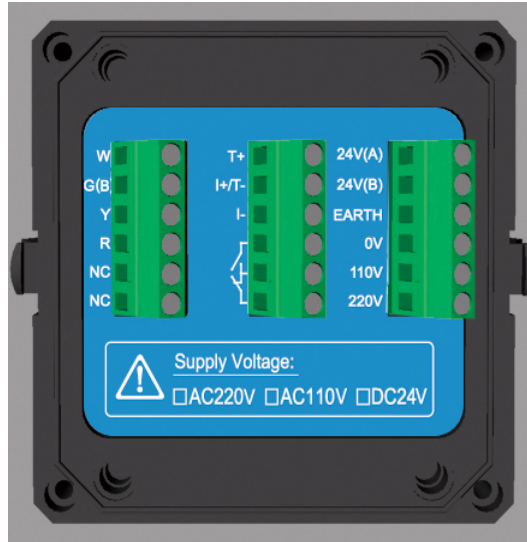
Temp. Compensation		NTC-10K Temperature Element		
Working Environment		Temp: 0~50°C Relative Humidity: ≤80%RH		
Trans. Output (4~20mA)		Isolated/Transferable/Revisable/Trans. Mode/Instru. Mode,		
		Loop Impedance 0~400 Ω : ±0.1mA		
Control Output	Output Contact	ON/OFF Double Contact Relay Output		
	Load Capability	AC 230V/5A Max		
Power Consumption		<2.5W		
Power Supply		CCT-5300E	CCT-5310E	CCT-5320/ CCT-5320E
		DC 24V±4V	AC 110V ±10%	AC 220V±10%
Supply Frequency (Hz)		-----	50/60	50/60
Fixing		Panel Mounted , clamp		
Product Dimension		96mm×96mm×105mm (H×W×D)		
Hole Dimension		91mm×91mm (H×W)		
Weight		0.27kg		

2. Product Dimension & Rear Panel Terminal Definition


2.1 Production Dimension



2.2 Rear Panel Terminal Definition

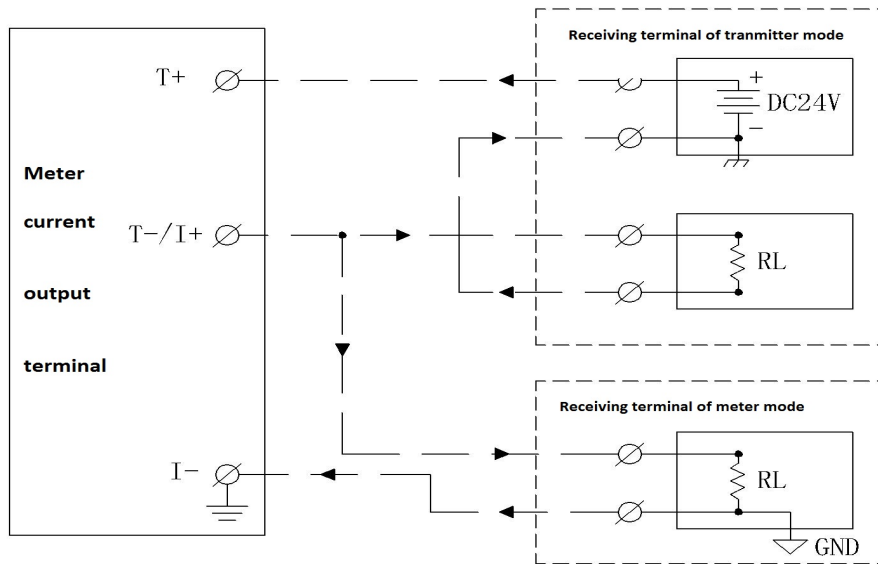


Terminal Connection

W	To conductivity cell cable (WHITE)
G(B)	To conductivity cell cable (GREEN)
Y	To conductivity cell cable (YELLOW)
R	To temp. (RED)
I+\I-	Instru. mode, internal power supply
T+\T-	Trans. mode, PLC system conditional module
	Relay Contact (ON/OFF)
DC 24V	Power Input Port, to DC 24V, Nonpolarized Connection (Only in CCT-5300E)
AC 110V	Power Input Port, to AC 110V (Only in CCT-5310E)
AC 220V	Power Input Port, to AC 220V (Only in CCT-5320/ CCT-5320E)
EARTH	Electromagnetic compatibility ground protection (Connect to ground)
NC	No connection

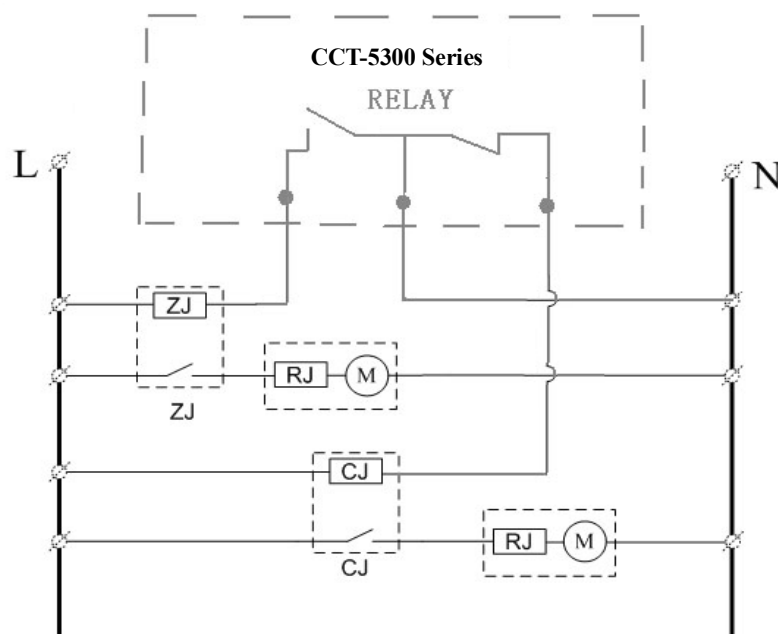
3. Wire Connection Reference Chart

3.1 mA Transmitter Wire Connection



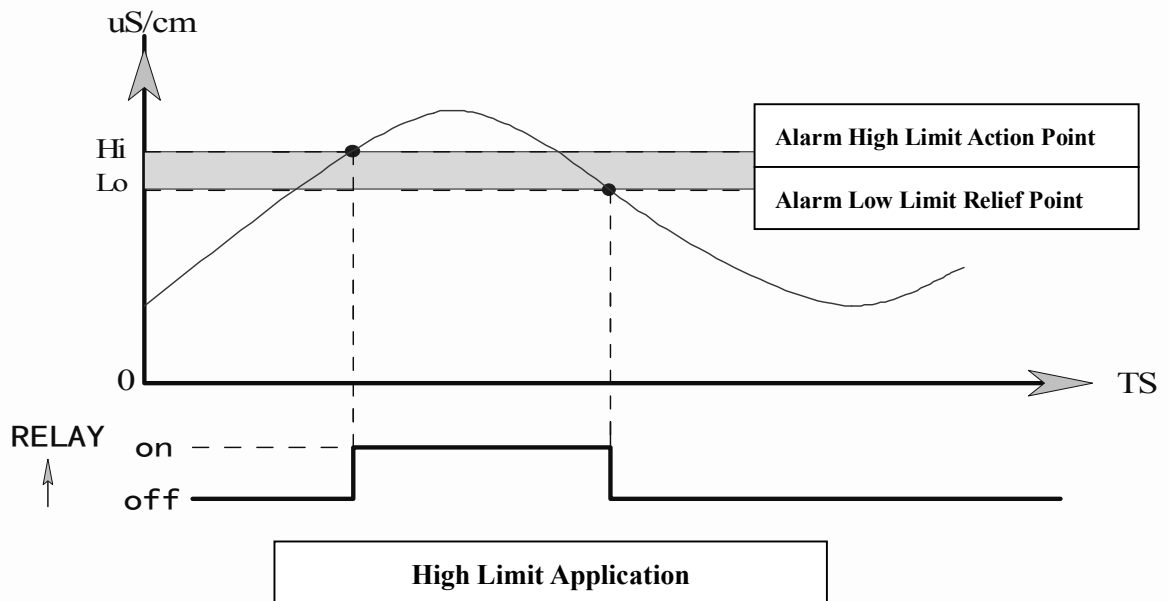
4-20mA Signal Connection in Instu. Mode/ Trans. Mode

3.2 Electrical Connection



ON/OFF Relay Control Connection

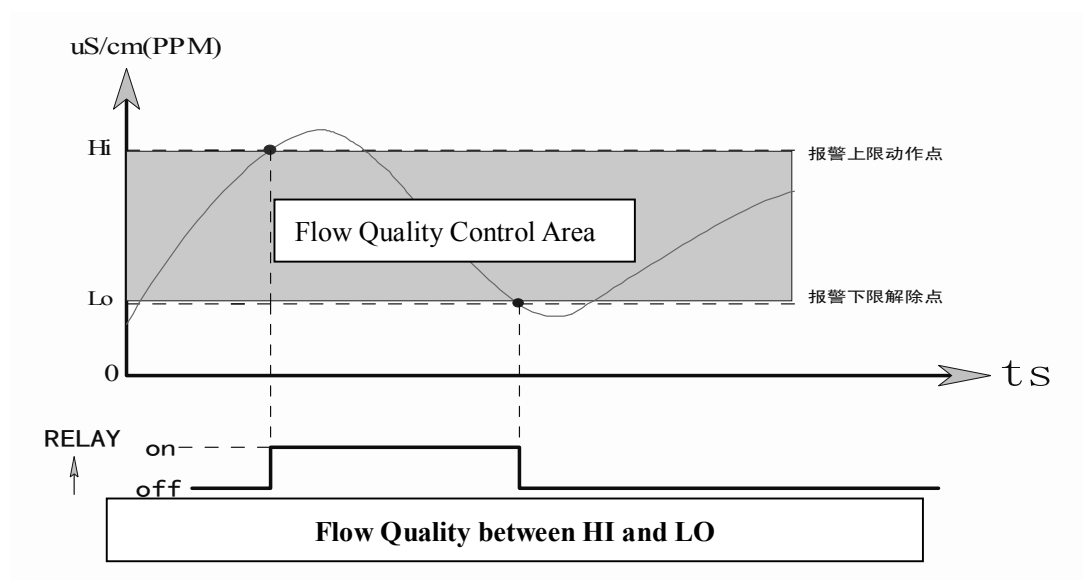
3.3 High Limit Set & Control



Case 1: Flow quality is controlled under High Limit

Applies to pharmacy, food industry, drinking industry, water purification, precise wash industry, electronic process and etc. Flow quality will be controlled at high limit, use magnetic valve to switch the flow direction in order to ensure the purification of flow.

When the flow quality back to "LO", switch to the process before. The period from "HI" point to "LO" point is delay period. Delay period avoids concussion of magnetic valve effectively.

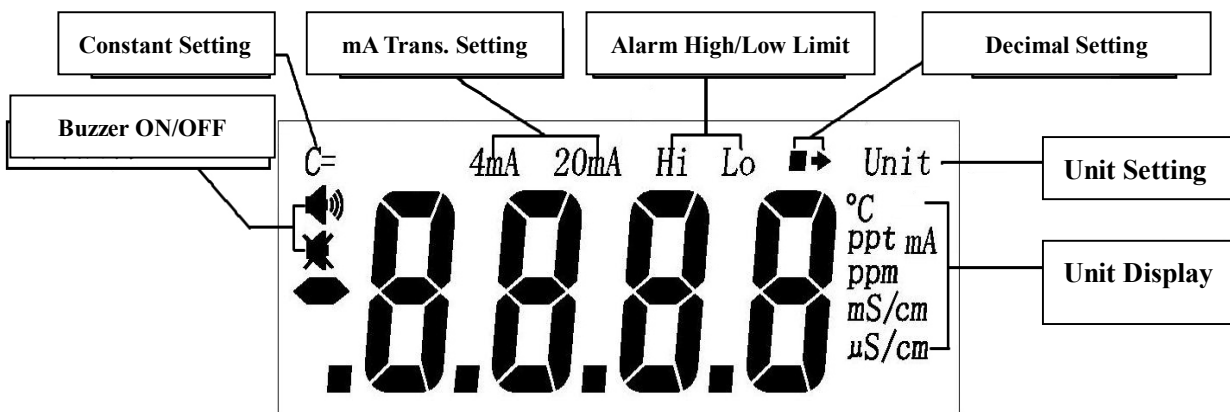
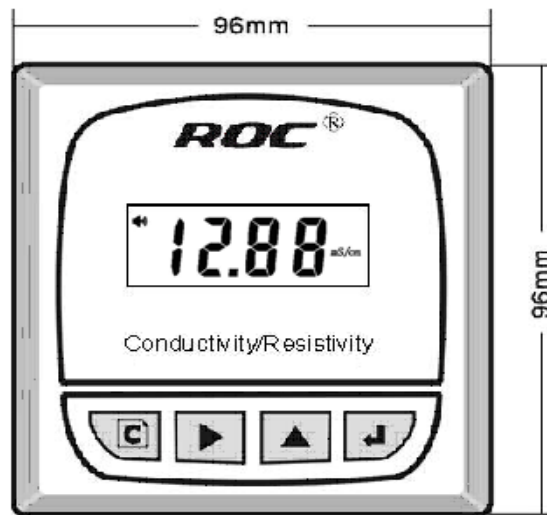


Case 2: Flow Quality Regional Window Control between HI and LO





Applies to circulating cooling water, cutting coolant, cleaning fluid and etc. When the flow quality is degraded to HI limit, system will enter pollution discharge or recycling. When the flow quality is acceptable to LO limit, pollution discharge or recycling will be stopped. This operation mode is called Regional Window Control.

4. Product Operating Setting


4.1 Front Panel Display & Main Interface Display








4.2 Key Instruction

Key	Name	Function
	Exit	In parameter setting, press to exit and back to main interface
	Digit Select	1. In parameter setting, selection of thousand, hundred, ten, single digit. 2. Decimal setting 3. In meas. mode, switch display ppm/ppt and TDS.
	Up	1. In parameter setting, change the chosen digit. 2. In meas. mode, switch temp/mA/conductivity.
	Enter	1. In main interface, enter parameter setting. 2. Save the chosen parameter, enter next menu.

4.3 Operation Interface Instruction

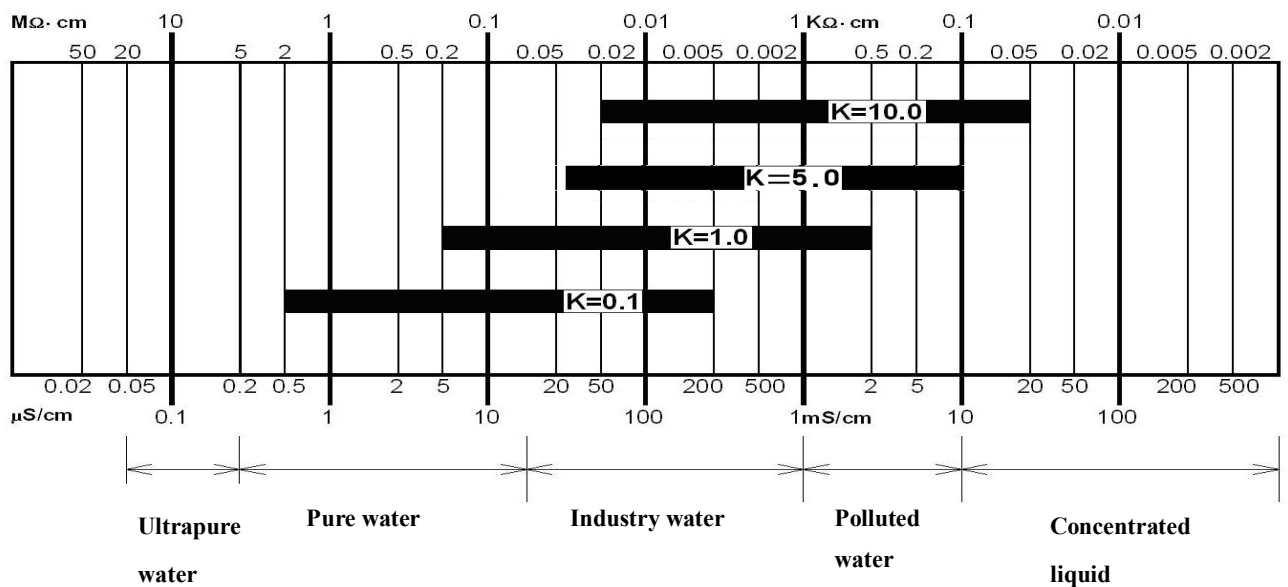
In measurement interface, press  for 3 seconds, enter the next setting menu automatically.

Order	Name	Function
1	Conductivity Cell Constant	 flashing, press <Digit choose> and <Up> to enter conductivity constant value, press<enter> to save and enter next parameter setting.
2	Decimal Setting	Decimal setting flashing, operate  to choose the decimal. Enter to save and go to next parameter setting.
3	Meas. Unit Setting	 Flashing, operate <Up> to select meas. unit (ppm , ppt, μ S/cm 或 mS/cm) , enter to save and go to next parameter setting.
4	4mA corresponding	 flashing, calibrate 4mA correspond value. Save to enter next parameter setting.
5	20mA corresponding	 flashing, calibrate 20mA correspond value. Save to enter next parameter setting.

6	Alarm High Limit Setting	[HI] and [Speaker] flashing, set alarm high limit, save and set the decimal, save again and enter next parameter setting.
7	Alarm High Limit Relief	[LO] 与 [Speaker] flashing, set high limit relief value, enter to save, choose the decimal and save again, enter the next parameter setting.
8	Alarm Switch	Only [Speaker] flashing, press <Up> to choose ON/OFF, enter to save, back to meas. display interface.

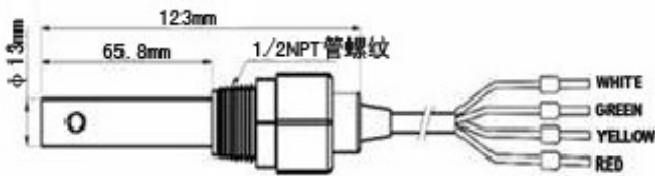
6. Conductivity Cell Installation

6.1 Conductivity Cell Constant

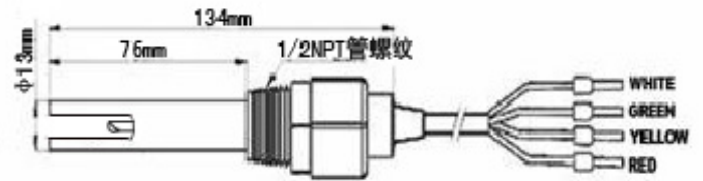


Choose conductivity cell constant according to flow quality

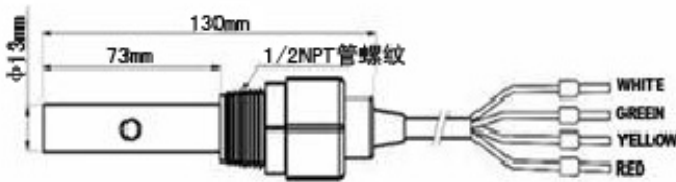
6.2 Conductivity Cell Appearance & Dimension



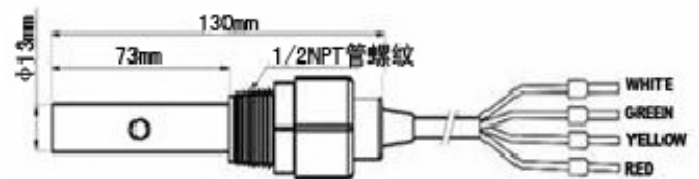
(C=0.1cm⁻¹) Sensor Dimension



(C=1.0cm⁻¹) Sensor Dimension



(C=5.0cm⁻¹) Sensor Dimension

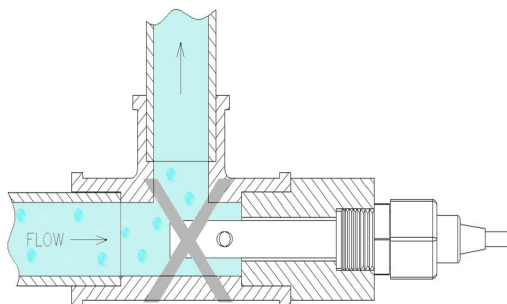


(C=10.0cm⁻¹) Sensor Dimension

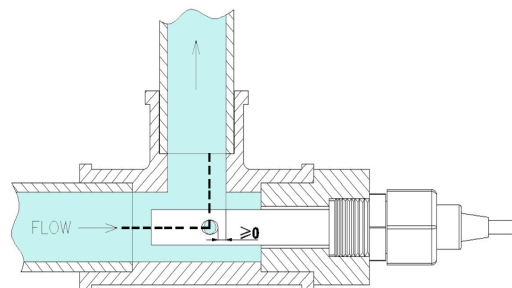
6.3 Conductivity Cell Installation

Conductivity cell installation is a key part, false installation will cause measurement value error, please confirm the install place, install way in advance, to avoid the measurement error.

- 1) In Diagram 1a, conductivity cell contact is too long, insert part is too short. This will cause measurement error. 1b is the correct way.

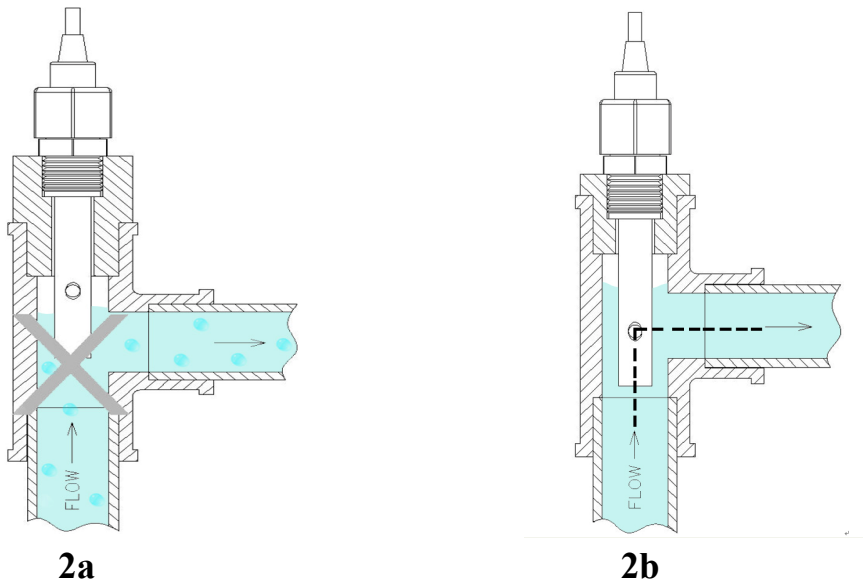


1a

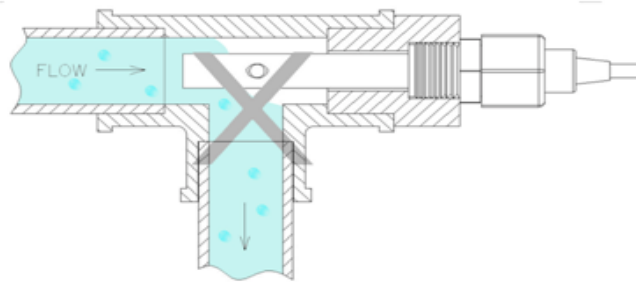


1b

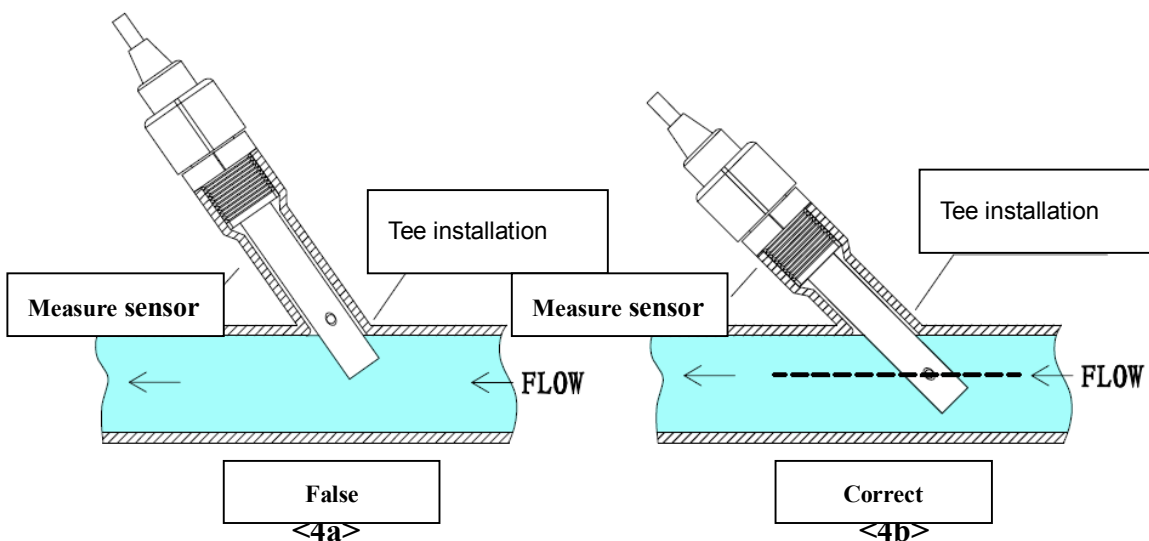
2) In diagram 2a, an instable air chamber in the conductivity cell will cause measurement error and instable. 2b is the correct way.



3) In diagram 3, flow couldn't fill the pipe, which will cause measurement error and instable.



2) In diagram 4a, flow couldn't pass measurement hole, this will cause measurement error and instable. Diagram 4b is correct.



6.4 Conductivity Cell Installation Caution

- 1) Conductivity cell should be installed in a closed and circulated pipe line where flow speed is stable and don't have large quantity of bubbles. DO NOT install in tank or pipe line open to air, to avoid measurement error.
- 2) Concentric tube should be installed horizontally, slantly or vertically to make sure to opposite flow direction and deep in the flow.
- 3) Measure signal is weak signal, so its collect wire must be individually installed. Forbidden to connect the power line and control line to the same cable connector or terminal. Forbidden to put the power line and control in the same pipe or tight together. These will avoid measurement error and damage to the meter.
- 4) Don't make the cable shorter or longer than its original length.
- 5) Ensure the measurement part of conductivity cell is clean. Don't touch it by hand or other object. Avoid greasy dirt, fat or rubber object on the measurement part.
- 6) Don't dispart conductivity cell or change its dimension or shape.
- 7) Don't wash or soak it with strong acid or alkali. Avoid scratch. Or this will cause constant change which will influence accuracy.
- 8) Avoid installing in the sunlight or wet area.
- 9) Please double check before connecting to the power.

7. Trouble Shooting

When the measurement is incorrect and instable, please operate as follows:

- 1) Problem Source: Disconnect the white cable on meter terminal, if the conductivity display is 0 and stable, then the meter is in right condition, please recheck the sensor installation.

Conductivity Cell Installation Problem: Take conductivity cell out of the pipe, test it with reference flow, if the display value is correct, please consider improper installation and sensor problem.

- (2) Check 4-20mA is in instrument mode or trans. mode.

When there is no connection to the terminals

mA Mode	Output Port	Port Voltage	Cable Voltage
Instru. Mode	I+/I-	>12V DC	Non
Trans. Mode	T+/T-	Non	DC24V

Other Common Faults:

Problem	Possible Factor	Solution
No display	A. No power supply B. Meter failure	A. Check whether there is voltage between meter and power supply B. Repair the meter
Instable Display	A False cell connection B False cell installation C Instable flow speed D Part flow too fast	A. Correct connection between meter and conductivity cell B Choose correct installation, to avoid bubbles and dead corner. C Choose other install place, pls avoid install cell effective part smooth turn D Part installed by reducing fitting for pipe below DN20 right-angled
Reading Error	A. False constant B. Constant change C. Improper flow speed D. False install	A. Reset the conductivity constant; B. Replace new conductivity cell or re-calibrate. C. Install in the right place D Install according to instruction
Measure Error	A. Breakdown of meter and conductivity cell B. False setting	A. If resistivity between red and white wire is $1M\Omega$, resistivity between yellow and white wire is $10K\Omega$, insulation between white and black wire $>100 M\Omega@100V$, conductivity is in right condition. B. Check the parameter setting.
mA Value non-corresponding	A. Receive trans. error B. Failure to reach 20mA C. False setting for transmitting	A. Reset receive trans. quantity B. Too high in loop resistance, enlarge the cross section of cable. C. Reset mA and its correspond

7. Complete Set

Conductivity TDS Trans. Controller	One pc (including one pair of clamp)
Conductivity Cell	One (Cable Length 5m)
Manual	One

9. Order Instruction

CCT-5300 series conductivity/TDS controller belongs to platform developer. Please confirm the following fittings before your order to guarantee your project: power supply, constant, material and fixation.

Controller	Power Supply	Cell Constant	Connection	Cell Material
<input type="checkbox"/> CCT-5300E	<input type="checkbox"/> DC 24V	<input type="checkbox"/> 0.10 cm ⁻¹	<input type="checkbox"/> Thread <input type="checkbox"/> Ferrule	<input type="checkbox"/> 316L
<input type="checkbox"/> CCT-5310E	<input type="checkbox"/> AC 110V	<input type="checkbox"/> 1.00 cm ⁻¹	<input type="checkbox"/> Thread <input type="checkbox"/> Ferrule	<input type="checkbox"/> 316L <input type="checkbox"/> Plastic
<input type="checkbox"/> CCT-5320E	<input type="checkbox"/> AC 220V	<input type="checkbox"/> 5.00 cm ⁻¹	<input type="checkbox"/> Thread <input type="checkbox"/> Ferrule	<input type="checkbox"/> Graphite
<input type="checkbox"/> CCT-5320	<input type="checkbox"/> AC 220V	<input type="checkbox"/> 10.00 cm ⁻¹	<input type="checkbox"/> Thread <input type="checkbox"/> Ferrule	<input type="checkbox"/> Graphite

Note: Cable Length Order: 1m、5m、10m、20m

Product type with the letter E : enhanced electromagnetic compatibility